



UNITED STATES DEPARTMENT OF COMMERCE
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MD

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/111,482 07/08/98 KIGUCHI H 101111

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IM22/0313

EXAMINER

YAMNITZKY, M

ART UNIT

PAPER NUMBER

1774

DATE MAILED:

03/13/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/111,482

Applicant(s)
Hiroshi KIGUCHI et al.

Examiner
M. Yamnitzky

Group Art Unit
1774



☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three (3) month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-31 is/are pending in the application.

Of the above, claim(s) 18-31 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-17 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☒ Claims 1-31 are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☒ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 5 & 7

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-17, drawn to a composition comprising a precursor of a conjugated organic polymer compound and a fluorescent dye, classified in class 252, subclass 301.16.
 - II. Claims 18-31, drawn to a method of making an organic EL element (device) by an ink jet method, classified in class 427, subclass 66.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions of Group I and of Group II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the product as claimed can be used in a materially different process such as spin-coating or roll-coating to form a layer comprising conjugated polymer and fluorescent dye.
3. Because these inventions are distinct for the reasons given above, have acquired a separate status in the art as shown by their different classification, and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

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4. During a telephone conversation with Mr. Thomas Pardini on 03/07/00, a provisional election was made with traverse to prosecute the invention of Group I, claims 1-17. Affirmation of this election must be made by applicant in replying to this Office action. Claims 18-30¹ are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Should one or more of the product claims subsequently be found to be allowable, one or more of the withdrawn process claims may be rejoined provided the conditions for rejoinder are met (see MPEP 821.04).

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

7. The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81. No new matter may be introduced in the required drawing.

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Page 6 of the present specification provides a brief description of Figures 1, 2, 3, 4 and 5. However, the brief description and the more detailed description of figures provided elsewhere in the specification do not correspond to the "drawings" submitted with the application.

The application papers indicate that 22 sheets of formal drawings were submitted. These 22 sheets contain Tables 1-22. There are no drawings showing Figures 1-5.

8. The disclosure is objected to because of the following informalities:

The specification and the claims use the term "polyallylene" in reference to polymers that are actually polyarylenes. (The term "allylene" indicates the structure $\text{CH}_3\text{C} \equiv \text{CH}$.) The examiner expects that the use of the term "polyallylene" results from an error in translation. One of skill in the art would readily recognize from the examples that the term "polyallylene" should read --polyarylene--

Appropriate correction is required.

9. Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The use of the term "kind" in claim 1 renders the claims indefinite. It is not certain what is meant by a "kind" of fluorescent dye. The examiner suggests deleting "kind of" from line 6 of claim 1.

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Proper antecedent basis is lacking for "the luminescence characteristic" as recited in claim 1. Further, in view of dependent claim 3, there is apparently more than one luminescence characteristic that can be changed by the at least one fluorescent dye. Other than a maximum wavelength of light absorption, it is not certain what "the luminescence characteristic" of claim 1 encompasses.

The use of the term "type" in claim 4 renders claim 4 indefinite. It is not certain what is encompassed by the phrase "hole injection and transfer type material" that is not encompassed by the phrase "hole injection and transfer material".

The use of the term "polyallylene" in claims 5 and 6 is not consistent with the specific polymer (polyparaphenylene) required by claim 6.

The use of the phrase "to be added" in claim 13 is confusing because the fluorescent dye is a component of the claimed composition rather than something which is separate from (to be added to) the claimed composition. The examiner suggests deleting "to be added" from line 2 of claim 13.

The "for preventing" phrase of claim 14 is confusing. In view of the specification, the composition is ultimately dried and solidified in order to make a luminescent layer. The language of claim 14 appears to require a component that would prevent the composition from being dried and solidified to form a luminescent layer.

The limitations imposed on the claimed composition by the contact angle requirement set forth in claim 15 are not clear. Unless all nozzle surfaces provided in heads of ink-jet devices are

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made of the same material, the contact angle will change from one ink-jet nozzle/head/device to another, and is not a function/property of the claimed composition *per se*.

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

11. Claims 1-6 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Shi (5,665,857).

Shi discloses a composition comprising a precursor of a conjugated organic polymer (such as polyparaphenylene vinylene), a fluorescent dye, and methanol (a polar solvent). The composition is used to form a light emitting layer of an organic EL device. See the whole patent. In particular, see column 2, line 48 to c. 4, l. 61 and c. 6, l. 40-53.

With respect to present claim 2, the method by which the claimed composition is used to form a luminescent layer places no positive limitations on the claimed composition. The prior art meets the compositional limitations of claim 2.

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 7-11, 13, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shi (5,665,857) as applied to claims 1-6 and 12 above, and for the further reasons set forth below.

With respect to present claims 7-11, Shi does not explicitly disclose the dyes required by these claims but teaches that known organic fluorescent dyes may be used. All of the fluorescent dyes of claim 7-11 are known. As is known in the art, different dyes provide different light emission characteristics (such as different colors). It would have been within the level of ordinary skill of a worker in the art at the time of the invention to select a suitable fluorescent dye from known fluorescent dyes to make the prior art invention. One of ordinary skill in the art would have been guided in the selection of a specific fluorescent dye based on the characteristics provided by the specific dye (such as the color of emitted light resulting from the use of the specific dye).

The range of present claim 13 is *prima facie* obvious in view of the prior art which teaches preferred amounts of dye in a range overlapping the presently claimed range. Further, it would have been within the level of ordinary skill of a worker in the art at the time of the invention, as a matter of routine experimentation, to determine suitable and optimum amounts of dye.

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Regarding present claims 16 and 17, the prior art suggests that the light emitting layer can be formed by spin-coating or casting from a methanol solution containing the precursor. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a composition of appropriate physical characteristics suitable for forming a layer according to known coating methods. It would have been within the level of ordinary skill of a worker in the art at the time of the invention, as a matter of routine experimentation and guided by knowledge in the art of coating, to determine suitable and optimum physical characteristics for the coating solution.

14. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

Nakano et al. (5,317,169) disclose a composition for forming a light emitting layer of an organic EL device, the composition comprising an intermediate of a conjugated organic polymer. Nakano et al. teach that the light emitting layer may also comprise another light emitting material such as known light emitting dyes, but does not explicitly disclose a composition comprising an intermediate of a conjugated organic polymer and a light emitting dye. For example, see column 7, line 59 to c. 8, l. 10 and c. 8, l. 56 to c. 9, l. 54.

Yamamoto et al. (5,540,999) teach that a light emitting layer of an organic EL device may comprise a combination of a conjugated organic polymer and a fluorescent dye, but do not

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disclose a composition comprising a precursor of the conjugated polymer and a fluorescent dye.

For example, see column 3, line 64 to c. 4, l. 29 to c. 11, l. 60 to c. 12, l. 7.

Ohnishi et al. (5,821,002) also teach that light emitting dyes may be used in combination with a conjugated organic polymer but do not disclose a composition comprising a precursor of the polymer and a fluorescent dye. For example, see column 2, line 53 to c. 3, l. 14 and c. 15, l. 45-64.

Furuki et al. (6,008,828) disclose a composition comprising a precursor of a conjugated organic polymer and a dye. The dye is not limited to a fluorescent dye though the usable dyes disclosed by Furuki et al. include dyes which are fluorescent. For example, see column 6, line 3 to c. 7, l. 34.

15. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (703) 308-4413. The examiner can generally be reached at this number from 6:45 a.m. to 3:15 p.m. Monday-Friday.

The current fax numbers for Art Unit 1774 are (703) 305-3599 for official after final faxes and (703) 305-5408 for all other official faxes. (Unofficial faxes for Art Unit 1774 can be sent to (703) 305-5436.)

MRY
03/09/00



MARIE YAMNITZKY
PRIMARY EXAMINER

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